Natural Gas to Gasoline by Haldor Topsøe's TIGAS™ Process

PEP Review 2021-05

December 2021

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Abstract

With the increased availability of low-cost natural gas, natural gas conversion to liquid fuels has attracted much attention from industry. Natural gas (NG) to liquid fuels has the potential to improve liquid fuel yields while lowering greenhouse gas emissions in areas with abundant gas resources. Converting NG to liquid fuels also can provide a means to energy independence and a diversified fuel portfolio.

As gasoline specifications reach new levels of stringency, Haldor Topsøe (HT) has responded to market needs with the Topsøe Improved Gasoline Synthesis (TIGAS™) process.

In this review, we update PEP's previous assessment of HT's TIGAS process (examined in PEP Report 245A, August 2005). The earlier TIGAS process used HT's proprietary bifunctional catalyst, which was able to convert syngas to methanol (MeOH) and dimethyl ether (DME) simultaneously, without separating the methanol. This gave the technology a slight edge over some contemporary methanol-to-gasoline (MTG) processes. In this new, advanced TIGAS process, Haldor Topsøe has improved the process by eliminating the DME synthesis step and converting raw methanol directly to gasoline. This improves the process economics and renders the process more competitive.

Our technology evaluation and economic feasibility study is based on information from the open literature combined with input from HT. An iPEP Navigator tool is provided with the electronic version of this review. This interactive module provides our assessment in a format that allows the user to explore the process, key process indicators, units of measure, and economics in different geographical regions.

Contents

Tables

Figures

Appendix C Figures

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